PAIENI COUPERATION THEATY

From the INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

14178727.SEP04

# $\mathsf{PCT}$

WRITTEN OPINION (PCT Rule 66)

То:	
HARRISON GODDARD Belgrave Hall Belgrave Street Leeds LS2 8DD GRANDE BRETAGNE	COPY

		Date of mailing (day/month/year)	24.09.2004	
Applicant's or agent's file reference AJC/P100377WO		REPLY DUE	within 1 month(s) from the above date of mailing	
International application No PCT/GB 03/02870	International filing date (day/month/year) 03.07.2003		Priority date (day/month/year) 03.07.2002	
International Patent Classification (IPC) or I G21F9/00	poin national classification a	and IPC		
Applicant BRITISH NUCLEAR FUELS PLC	et al.			
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- 1. This written opinion is the first drawn up by this International Preliminary Examining Authority.
- 2. This opinion contains indications relating to the following items:
  - Basis of the opinion
  - I Priority
  - III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV Lack of unity of invention
  - V Measoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI 

    Certain documents cited
  - VII 

    Certain defects in the international application
  - VIII 

    Certain observations on the international application
- 3. The applicant is hereby invited to reply to this opinion.
  - When? See the time limit indicated above. The applicant may, before the expiration of that time limit,

request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3.

For the form and the language of the amendments, see Rules 66.8 and 66.9.

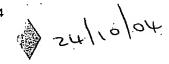
Also: For an additional opportunity to submit amendments, see Rule 66.4.

For the examiner's obligation to consider amendments and/or arguments, see Rule 66 4 bis.

For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

 The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 03.11.2004



Name and mailing address of the international preliminary examining authority:

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European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 Authorized Officer

Deroubaix, P

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1	the	With regard to the <b>elements</b> of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):						
			•					
	De	scription, Pages						
	1-5	• •	as originally filed					
	, -		as angmany mad					
	Cla	nims, Numbers			•			
	1-1	3	as originally filed			. •		
2	. Wil lan	th regard to the langu guage in which the in	uage, all the elements marked nternational application was file	above were available d, unless otherwise in	or furnished to this Aut dicated under this item	thority in the		
	The	ese elements were av	vailable or furnished to this Aut	hority in the following !	language: , which is	<b>S:</b>		
		the language of pub	ranslation furnished for the purp plication of the international app ranslation furnished for the purp .3).	olication (under Rule 4	8.3(b)).			
3.	Wit	With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the nternational preliminary examination was carried out on the basis of the sequence listing:						
		contained in the inte	ernational application in written	form.				
		filed together with th	ne international application in co	omputer readable forπ	1.			
		furnished subseque	ntly to this Authority in written f	orm.				
		furnished subseque	ntly to this Authority in compute	er readable form:				
		The statement that in the international a	the subsequently furnished writ application as filed has been fu	ten sequence listing d nished.	oes not go beyond the	disclosure		
٠		The statement that the listing has been furn	the information recorded in con iished.	nputer readable form is	s identical to the writte	n sequence		
1.	The	amendments have r	esulted in the cancellation of:					
		the description,	pages:					
		the claims,	Nos.:					
		the drawings,	sheets:			•		
Š.	Π.	This opinion has bee	en established as if (some of) tl go beyond the disclosure as file	ne amendments had n ed (Rule 70.2(c)).	ot been made, since th	ney have		

- 6. Additional observations, if necessary:
- V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- 1. Statement

## WRITTEN OPINION

International application No.

PCT/GB 03/02870

Novelty (N)

Claims

1,3-7,13 no

Inventive step (IS)

Claims

2,8-12 no

Industrial applicability (IA)

Claims

1-13 yes

2. Citations and explanations

see separate sheet

### Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: WO 96/02918 A (TERRA ENVIRONMENTAL) 1 February 1996 (1996-02-01)

D2: US-A-4 010 108 (HANSEN LARRY J ET AL) 1 March 1977 (1977-03-01)

D3: US-A-4 839 102 (BERNARD ANDRE ET AL) 13 June 1989 (1989-06-13)

D4: US-A-4 416 810 (NOAKES JOHN E) 22 November 1983 (1983-11-22)

D5: US-A-4 792 385 (SNYDER THOMAS S ET AL) 20 December 1988 (1988-

12-20)

D6: US-A-4 931 192 (MCBRIDE MICHAEL A ET AL) 5 June 1990 (1990-06-05)

#### 1. OBJECTIONS AS TO NOVELTY (ARTICLE 33(2) PCT)

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1,3-7,13 is not new in the sense of Article 33(2) PCT.

### Claim 1

Document D1 discloses (see claims 31,33,34 and 40 of D1) a method for the encapsulation of a nuclear material which comprises treating the material with an encapsulant which comprises a cementitious material and curing said cementitious material.

The subject-matter of claim 1 is therefore not new.

### Claim 3

In the method of D1, the cementitious material comprises Portland cement.

The subject-matter of claim 3 is therefore not new.

#### Claim 4

In the method of D1 (see claims 22 and 23), the cementitious material additionally comprises one ore more inorganic fillers.

The subject-matter of claim 4 is therefore not new.

#### Claim 5

In the method of D1, the cementitious material is provided in the form of an aqueous composition.

The subject-matter of claim 5 is therefore not new.

### Claim 6

In the method of D1 (see claim 8), the water content of the composition is in the region of 40-50% by weight.

The subject-matter of claim 6 is therefore not new.

### Claim 13

Referring to D1, it appears that the subject-matter of claim 13 is not either new.

Furthermore, referring to any one of documents D2, D3 and D4, the subject-matter of claims 1,3-6,13 appear to lack novelty, and referring to D5 or D6, the subject-matter of claims 1 and 13 again appear to lack novelty.

#### Claim 7

In the method of D4 (see column 10, lines 21-22), the nuclear material is placed in an appropriate container and a cementitious material is added and allowed to at least partially cure.

The subject-matter of claim 7 is therefore not new.

2. OBJECTIONS AS TO INVENTIVE STEP (ARTICLE (33(3) PCT)

### WRITTEN OPINION SEPARATE SHEET

Claims 2,8-12

The features of claims 2 and 8-12 are merely straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

Thus the subject-matter of said claims does not involve an inventive step and does not satisfy the criterion set forth in Article 33(3) PCT.

### **CLAIMS**

1. A method for the encapsulation of a nuclear material which comprises treating the material with an encapsulant which comprises a cementitious material and curing said cementitious material, characterised in that said nuclear material comprises uranium metal or Magnox fuel elements or fuel element debris.

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- 2. A method as claimed in claim 1 wherein the cementitious material comprises

  10 Portland Cement.
  - 3. A method as claimed in claim 1 or 2 wherein the cementitious material additionally comprises one or more inorganic fillers selected from blast furnace slag, pulverised fuel ash, hydrated lime, finely divided silica, limestone flour and organic and inorganic fluidising agents.
  - 4. A method as claimed in claim 1, 2 or 3 wherein the cementitious material is provided in the form of an aqueous composition.
- A method as claimed in claim 4 wherein the water content of the composition is in the region of 40-50% (w/w).
  - 6. A method as claimed in any one of claims 1 to 5 wherein the nuclear material is placed in an appropriate container and a cementitious material is added and allowed to at least partially cure.
    - 7. A method as claimed in claim 6 wherein elements of the nuclear material are either arrayed in the container or mixed haphazardly.
- A method as claimed in claim 6 or 7 wherein the container is subsequently capped.

- 9. A method as claimed in claim 6, 7 or 8 wherein the container comprises a drum having a capacity in the region of 500 litres.
- 10. A method as claimed in claim 9 wherein the amount of nuclear material stored is up to 52 elements.
  - 11. A method as claimed in claim 10 wherein the number of elements is of the order of 22.
- 10 12. A method for the storage of a nuclear material which comprises encapsulation of the material in a cured cementitious material, wherein said nuclear material comprises uranium metal or Magnox fuel elements or fuel element debris.

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P100377WOclaims2